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| 10/782,617 | 02/19/2004 | Jeffrey P. Bradford | RPS920030131US1 (IRA-10-5 | 5100 |

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| EXAMINER | |
|---|---|
| MERED, HABTE | |

| ART UNIT | PAPER NUMBER |
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| 2616 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/782,617 | BRADFORD ET AL. | |
| | Examiner | Art Unit | |
| | Habte Mered | 2616 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *09 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *19-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 February 2004* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. The amendment filed on 10/09/2007 has been entered and fully considered.

2. Claims 19-33 are pending. Claims 19, 24, and 29 are the base independent claims. Claims 1-18 are cancelled.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claim 19** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 6 of claim 19, the phrase "transmit probability is greater than or equal to one" is confusing. It is well known in the art that probability of any occurrence lies between zero and 1 and cannot be greater than one. Hence depended claims 20-23 have also been rejected as they depend on a parent claim rejected under 112 2nd paragraph.

2. **Claim 24** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 10 of claim 24, the phrase "transmit probability is greater than or equal to one" is confusing. It is well known in the art that probability of any occurrence lies between zero and 1 and cannot be greater than one. Hence depended claims 25-28

have also been rejected as they depend on a parent claim rejected under 112. 2nd paragraph.

3. **Claim 29** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 8 of claim 29, the phrase "transmit probability is greater than or equal to one" is confusing. It is well known in the art that probability of any occurrence lies between zero and 1 and cannot be greater than one. Hence depended claims 30-33 have also been rejected as they depend on a parent claim rejected under 112. 2nd paragraph.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. **Claims 19-33,** as best understood in view of the 112 2nd paragraph rejections, are rejected under 35 U.S.C. 103(a) as being unpatentable over Aydemir et al (Int. Pub. WO 01/39467), hereinafter referred to as Aydemir In view of Bowen et al (Ed Bowen, Clark Jeffries, "Bandwidth Allocation for Non-Responsive Flows with Active Queue Management", IEEE, 2002), hereinafter referred to as Bowen and VanZante et al (US 6079034), hereinafter referred to VanZante.

*Aydemir teaches method and system for controlling transmission of packets in computer networks.*

2. Regarding **claim 19**, Aydemir discloses a method for managing and transmitting a plurality of data packets through a queue in a computer network system **(See Figures 1-3)**, comprising the steps of:

determining a transmit probability of a computer network system queue as a function of an average occupancy level **(See Page 16 – Aydemir refers to transmit probability as transmit/transmission fraction and ranges between 0 and 1 and is properly defined on page 17 showing its dependence on average occupancy level of queue – see also Figure 9)**;

determining a low level threshold for the queue as a fraction of a maximum capacity of the queue wherein the transmit probability is greater than or equal to one **(See Figure 8, step 102 and page 20 lines 4-12)**;

determining a hysteresis level threshold for the queue as a positive hysteresis factor multiple of the low level threshold wherein the hysteresis level threshold is greater than the low level threshold and less than the maximum capacity of the queue **(For Aydemir hysteresis threshold level is equal to the maximum level threshold as seen on Figure 8)** ; initializing a hysteresis flag to ON;

in response to the queue receiving a first burst of packets wherein the hysteresis flag is set to ON:

(a) comparing a queue level to the hysteresis level threshold, **(See Figure 8, step 108)** and

(b) if the queue level is less than the hysteresis level threshold, the queue receiving and transmitting the first burst and revising the transmit probability **(See Figure 8, step 106)**; or

(c) else randomly dropping at least one packet from the first burst responsive to the transmit probability and transmitting a remainder of the first burst packets, revising the transmit probability and resetting the hysteresis flag to OFF; in response to the queue receiving a subsequent burst of packets **(See Figure 8, step 112):**

determining an ON/OFF state of the hysteresis flag;

if the determined hysteresis flag state is ON, then performing the hysteresis level threshold (a) comparing and (b) receiving, transmitting and revising or (e) dropping, transmitting, revising and resetting steps with respect to the subsequent burst **(See Figure 11 – steps 142-158) )**.

Aydemir fail to teach use of hysteresis flag and hysteresis threshold.

*VanZante teaches automatic network fault detection and isolation.*

VanZante teaches use of hysteresis flag and hysteresis threshold. **(See Column 6:40-56)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Aydemir's method to incorporate use of hysteresis flag and hysteresis threshold. The motivation to use a hysteresis flag is that it helps the system memorize the hysteresis status easily as indicated by VanZante in Column 6:44.

Aydemir fails to expressly disclose comparing a queue level to the low level threshold, and if the queue level is less than the low level threshold and an aggregate

traffic bandwidth presented to a network link connecting the queue to a node transmitting the subsequent burst is less than a maximum bandwidth capacity supported by the link, the queue receiving and transmitting the subsequent burst, revising the transmit probability, or else the queue receiving the subsequent burst, randomly dropping at least one packet from the subsequent burst in response to the transmit probability, transmitting a remainder of the subsequent burst packets, and revising the transmit probability.

Bowen discloses disclose comparing a queue level to the low level threshold, and if the queue level is less than the low level threshold and an aggregate traffic bandwidth presented to a network link connecting the queue to a node transmitting the subsequent burst is less than a maximum bandwidth capacity supported by the link, the queue receiving and transmitting the subsequent burst, revising the transmit probability, or else the queue receiving the subsequent burst, randomly dropping at least one packet from the subsequent burst in response to the transmit probability, transmitting a remainder of the subsequent burst packets, and revising the transmit probability. **(See Section III on page 13-3 and 13-4 how the transmit probability as a function of bandwidth and queue)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Aydemir's method to incorporate the step of comparing a queue level to the low level threshold, and if the queue level is less than the low level threshold and an aggregate traffic bandwidth presented to a network link connecting the queue to a node transmitting the subsequent burst is less than a maximum bandwidth

capacity supported by the link, the queue receiving and transmitting the subsequent burst, revising the transmit probability, or else the queue receiving the subsequent burst, randomly dropping at least one packet from the subsequent burst in response to the transmit probability, transmitting a remainder of the subsequent burst packets, and revising the transmit probability. The motivations for such an adaptive control algorithm is to achieve an optimal transmit probability as indicated by Bowen on page 13-3, 2nd column, lines 14-20.

3. Regarding **claim 24**, Aydemir discloses a data flow manager **(Figure 2, element 12 or 16)** configured for managing and transmitting data packets through a queue in a computer system, comprising: a queue having a queue level in communication the data flow manager **(Figure 3 elements 19, 20, 23, 24, 32, and 34)**; and a node in communication with the data flow manager; and a node in communication with the queue through a network link, the link having a maximum bandwidth capacity; wherein the data flow manager is configured to:

determine a transmit probability of a computer network system queue as a function of an average occupancy level **(See Page 16 – Aydemir refers to transmit probability as transmit/transmission fraction and ranges between 0 and 1 and is properly defined on page 17 showing its dependence on average occupancy level of queue – see also Figure 9)**;

determine a low level threshold for the queue as a fraction of a maximum capacity of the queue wherein the transmit probability is greater than or equal to one **(See Figure 8, step 102 and page 20 lines 4-12)**;

determine a hysteresis level threshold for the queue as a positive hysteresis factor multiple of the low level threshold wherein the hysteresis level threshold is greater than the low level threshold and less than the maximum capacity of the queue **(For Aydemir hysteresis threshold level is equal to the maximum level threshold as seen on Figure 8)** ; initializing a hysteresis flag to ON;

in response to the queue receiving a first burst of packets wherein the hysteresis flag is set to ON:

(a) comparing a queue level to the hysteresis level threshold, **(See Figure 8, step 108)** and

(b) if the queue level is less than the hysteresis level threshold, the queue receiving and transmitting the first burst and revising the transmit probability **(See Figure 8, step 106)**; or

(c) else randomly dropping at least one packet from the first burst responsive to the transmit probability and transmitting a remainder of the first burst packets, revising the transmit probability and resetting the hysteresis flag to OFF; in response to the queue receiving a subsequent burst of packets **(See Figure 8, step 112):**

determine an ON/OFF state of the hysteresis flag;

if the determined hysteresis flag state is ON, then performing the hysteresis level threshold (a) comparing and (b) receiving, transmitting and revising or (e) dropping, transmitting, revising and resetting steps with respect to the subsequent burst **(See Figure 11 – steps 142-158) )**.

Aydemir fail to teach use of hysteresis flag and hysteresis threshold.

*VanZante teaches automatic network fault detection and isolation.*

VanZante teaches use of hysteresis flag and hysteresis threshold. **(See Column 6:40-56)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Aydemir's data flow manager to incorporate use of hysteresis flag and hysteresis threshold. The motivation to use a hysteresis flag is that it helps the system memorize the hysteresis status easily as indicated by VanZante in Column 6:44.

Aydemir fails to expressly disclose if the queue level is less than the low level threshold and an aggregate traffic bandwidth presented to the network link is less than the maximum bandwidth capacity, cause the queue to receive and transmit the subsequent burst, the data manager further configured to revise the transmit probability; or else cause the queue to receive the subsequent burst, randomly drop at least one packet from the subsequent burst in response to the transmit probability, and transmit a remainder of the subsequent burst packets, the data manager further configured to revise the transmit probability. **(See Section III on page 13-3 and 13-4 how the transmit probability as a function of bandwidth and queue)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Aydemir's data manager to incorporate the step of comparing a queue level to the low level threshold, and if the queue level is less than the low level threshold and an aggregate traffic bandwidth presented to a network link connecting the queue to a node transmitting the subsequent burst is less than a

maximum bandwidth capacity supported by the link, the queue receiving and transmitting the subsequent burst, revising the transmit probability, or else the queue receiving the subsequent burst, randomly dropping at least one packet from the subsequent burst in response to the transmit probability, transmitting a remainder of the subsequent burst packets, and revising the transmit probability. The motivations for such an adaptive control algorithm is to achieve an optimal transmit probability as indicated by Bowen on page 13-3, 2nd column, lines 14-20.

4. Regarding **claim 29**, Aydemir discloses an article of manufacture comprising a computer usable medium having a computer readable program embodied in the medium, wherein the computer readable program **(See Figures 1-3)**, when executed causes the computer to manage network data flow by: determining a transmit probability of a computer network system queue as a function of an average occupancy level **(See Page 16 – Aydemir refers to transmit probability as transmit/transmission fraction and ranges between 0 and 1 and is properly defined on page 17 showing its dependence on average occupancy level of queue – see also Figure 9)**;

determining a low level threshold for the queue as a fraction of a maximum capacity of the queue wherein the transmit probability is greater than or equal to one **(See Figure 8, step 102 and page 20 lines 4-12)**;

determining a hysteresis level threshold for the queue as a positive hysteresis factor multiple of the low level threshold wherein the hysteresis level threshold is greater than the low level threshold and less than the maximum capacity of the queue **(For Aydemir hysteresis threshold level is equal to the maximum level threshold as**

**seen on Figure 8)** ; initializing a hysteresis flag to ON;

in response to the queue receiving a first burst of packets wherein the hysteresis flag is set to ON:

(a) comparing a queue level to the hysteresis level threshold, **(See Figure 8, step 108)** and

(b) if the queue level is less than the hysteresis level threshold, the queue receiving and transmitting the first burst and revising the transmit probability **(See Figure 8, step 106)**; or

(c) else randomly dropping at least one packet from the first burst responsive to the transmit probability and transmitting a remainder of the first burst packets, revising the transmit probability and resetting the hysteresis flag to OFF; in response to the queue receiving a subsequent burst of packets **(See Figure 8, step 112):**

determining an ON/OFF state of the hysteresis flag;

if the determined hysteresis flag state is ON, then performing the hysteresis level threshold (a) comparing and (b) receiving, transmitting and revising or (e) dropping, transmitting, revising and resetting steps with respect to the subsequent burst **(See Figure 11 – steps 142-158) )**.

Aydemir fail to teach use of hysteresis flag and hysteresis threshold.

*VanZante teaches automatic network fault detection and isolation.*

VanZante teaches use of hysteresis flag and hysteresis threshold. **(See Column 6:40-56)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Aydemir's article of manufacture to incorporate use of hysteresis flag and hysteresis threshold. The motivation to use a hysteresis flag is that it helps the system memorize the hysteresis status easily as indicated by VanZante in Column 6:44.

Aydemir fails to expressly disclose comparing a queue level to the low level threshold, and if the queue level is less than the low level threshold and an aggregate traffic bandwidth presented to a network link connecting the queue to a node transmitting the subsequent burst is less than a maximum bandwidth capacity supported by the link, the queue receiving and transmitting the subsequent burst, revising the transmit probability, or else the queue receiving the subsequent burst, randomly dropping at least one packet from the subsequent burst in response to the transmit probability, transmitting a remainder of the subsequent burst packets, and revising the transmit probability.

Bowen discloses disclose comparing a queue level to the low level threshold, and if the queue level is less than the low level threshold and an aggregate traffic bandwidth presented to a network link connecting the queue to a node transmitting the subsequent burst is less than a maximum bandwidth capacity supported by the link, the queue receiving and transmitting the subsequent burst, revising the transmit probability, or else the queue receiving the subsequent burst, randomly dropping at least one packet from the subsequent burst in response to the transmit probability, transmitting a remainder of the subsequent burst packets, and revising the transmit probability. **(See**

**Section III on page 13-3 and 13-4 how the transmit probability as a function of bandwidth and queue)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Aydemir's article of manufacture to incorporate the step of comparing a queue level to the low level threshold, and if the queue level is less than the low level threshold and an aggregate traffic bandwidth presented to a network link connecting the queue to a node transmitting the subsequent burst is less than a maximum bandwidth capacity supported by the link, the queue receiving and transmitting the subsequent burst, revising the transmit probability, or else the queue receiving the subsequent burst, randomly dropping at least one packet from the subsequent burst in response to the transmit probability, transmitting a remainder of the subsequent burst packets, and revising the transmit probability. The motivations for such an adaptive control algorithm is to achieve an optimal transmit probability as indicated by Bowen on page 13-3, 2nd column, lines 14-20.

5. Regarding **claims 20, 25, and 30**, the combination of Aydemir, Bowen, and VanZante disclose the method, data flow manager , and article of manufacture further configured to periodically update the transmit probability and the hysteresis level threshold as a function of size of the queue and the aggregate traffic bandwidth. **(See Bowen last paragraph on page 13-3 and first paragraph on page 13-4)**

6. Regarding **claims 21, 26, and 31**, the combination of Aydemir, Bowen, and VanZante disclose the method, data flow manager, and article of manufacture further

configured to determine or revise the transmit probability as a function of the hysteresis flag state. . **(See VanZante's Column 6:40-56)**

7. Regarding **claims 22, 27, and 32,** the combination of Aydemir, Bowen, and VanZante disclose the method, data flow manager, and article of manufacture wherein determining or revising the transmit probability comprises defining the transmit probability as a transmit fraction Ti as a function of a data flow parameter fi and a service rate S of the network system by applying a bandwidth allocation transmit algorithm comprising; determining if the hysteresis flag is ON or OFF; if the flag is ON, incrementing or decrementing Ti by: if fi(t) = fi, min, then Ti(t + dt) = min(1, Ti(t) + w); if fi(t) > fi, max, then Ti(t + dt) = Ti(t)(1-w); if B(t) = 1, then Ti(t + dt) = min(l, Ti(t)+CiBavg(t)); or else, Ti(t + dr) = Ti(t)(1-DiOi(t)); where Ci is an increment constant equal to (S + fi, min-(fl, min + f2,min +...+ fn, min))/16, and Di is a decrement constant equal to (S - fi, min)*4, or if the hysteresis flag is OFF, incrementing or decrementing Ti by:

if the queue level is increasing, setting Ti = F(Ci), wherein F(Ci) is a bandwidth allocation transmit decreasing function; or

if the queue level is decreasing, setting Ti = G(Di), wherein G(Di) is a bandwidth allocation transmit increasing function. **(See Bowen last paragraph on page 13-3 and first paragraph on page 13-4)**

8. Regarding **claims 23, 28, and 33,** the combination of Aydemir, Bowen, and VanZante disclose the method, data flow manager, and article of manufacture wherein

F(Ci)=Ci/2 and G(Di)=min(1,2*Di). **(See Bowen last paragraph on page 13-3 and first paragraph on page 13-4)**

***Response to Arguments***

Applicant's arguments with respect to new claims 19-33 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris H. To can be reached on 571 272 7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

12-24-2007
HM

KWANG BIN YAO
SUPERVISORY PATENT EXAMINER